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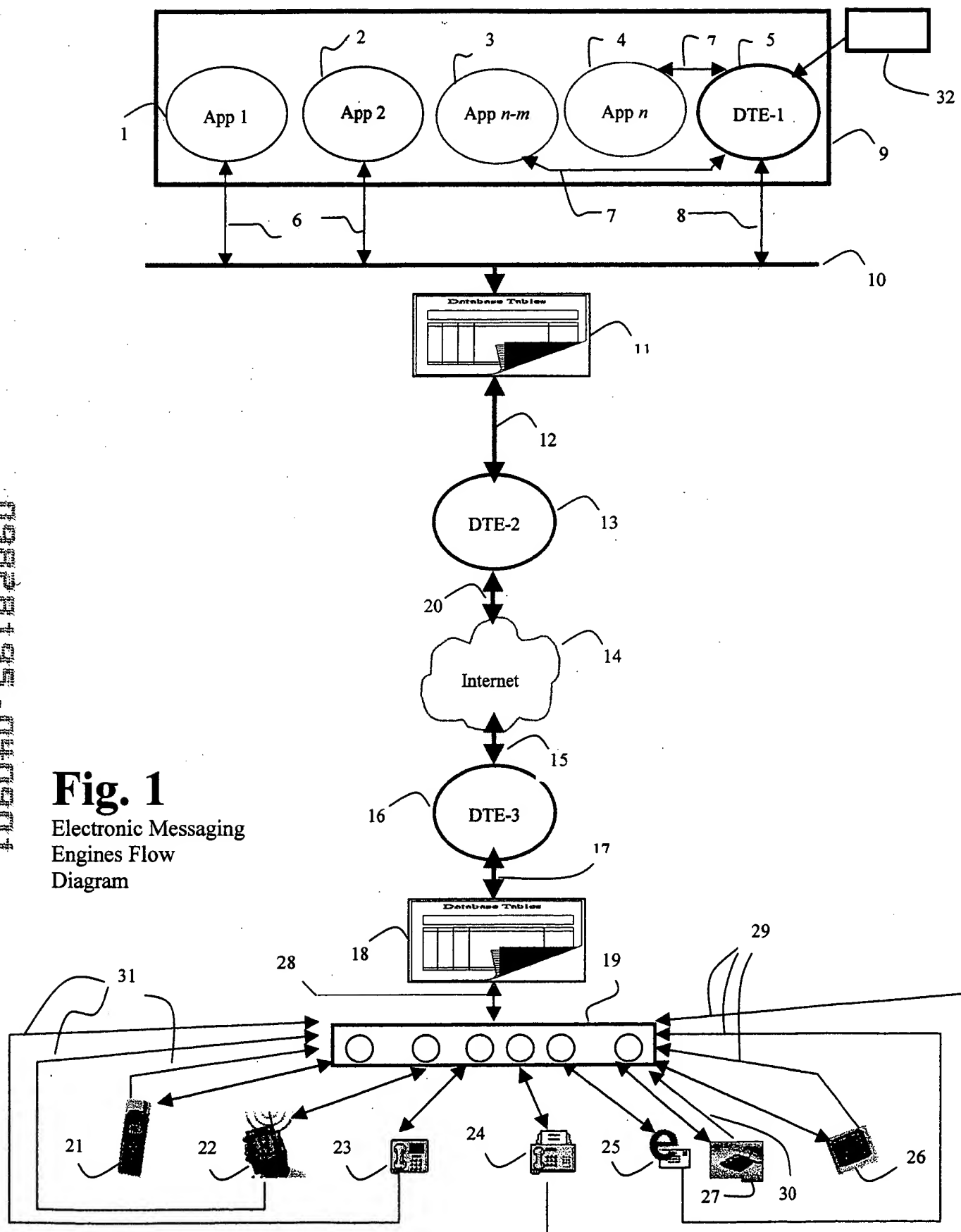


Fig. 1
Electronic Messaging
Engines Flow
Diagram

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Field Name	Data Type	Description
MMsgID	AutoNumber	A unique message record number
MADT	Date/Time	Message arrival date and time
MDDate	Date/Time	Message to be delivered on this date
MDTime	Date/Time	Message to be delivered at this time
MDTZone	Text	Message delivery worldwide time zone
S_Directory	Text	Directory name where detailed information about S_UserID is found
S_UserID	Text	Sender's userid (encrypted)
S_Password	Text	Sender's password (encrypted)
S_AuthCode	Text	Sender's authorization code (encrypted)
S_email	Text	Sender's Regular e-mail
S_MP	Text	Sender's Mobile Phone
S_HP	Text	Sender's Home Phone
S_WP	Text	Sender's Work Phone
S_PP	Text	Sender's Pager Pn
S_PPN	Text	Sender's Pager Modem Number
S_FN	Text	Sender's Fax Number
S_PPNM	Text	Sender's Palm Pilot e-mail
S_FD1	Text	Sender's Future Messaging Device 1
S_FD2	Text	Sender's Future Messaging Device 2
S_FD3	Text	Sender's Future Messaging Device 3
D_UserID	Text	Destination UserID
D_Directory	Text	Directory name where detailed information about D_UserID is found
D_email	Text	Destination e-mail
D_MP	Text	Destination Mobile Phone
D_HP	Text	Destination Home Phone
D_WP	Text	Destination Work Phone
D_PP	Text	Destination Pager Pn
D_PPN	Text	Destination Pager Modem Number
D_PN	Text	Destination Pager e-mail
D_PPNM	Text	Destination Palm Pilot e-mail
D_FD1	Text	Destination Future Messaging Device 1
D_FD2	Text	Destination Future Messaging Device 2
D_FD3	Text	Destination Future Messaging Device 3
SO_email	Text	Status of message sent via e-mail
SO_MP	Text	Status of message sent to mobile phone
SO_WP	Text	Status of message sent to work phone
SO_PP	Text	Status of message sent to pager
SO_PPN	Text	Status of message sent to palm pilot
SO_FD1	Text	Status of message sent to future device
SO_FD2	Text	Status of message sent to future device
SO_FD3	Text	Status of message sent to future device
StartUpSound	Text	Initial voice or sound file
StandardMsg	Text	Standard (Tone) Text-to-speech message
TextMsg	Text	Message
VoiceMsg	Text	Voice Recorded Message
SoundMsg	Text	Sound part of the message
FormattedMsg	Text	Formatted message file such as MS WORD, HTML, etc formatted files
GraphicsMsg	Text	Graphics part of the message
VideoMsg	Text	Video part of the message
FutureMsg1	Text	Message for futuremessaging device 1
FutureMsg2	Text	Message for futuremessaging device 2
FutureMsg3	Text	Message for futuremessaging device 3
EndingVoiceSound	Text	Initial Vox file
SDZone	Text	Scheduled Destination Zone
SDOT	Text	Scheduled Destination Date and Time
Priority	Number	Priority
Command	Text	Command to execute on this host
AutoEscalation	Text	Automatic Escalation, On=Yes, 1=Yes, 2=Send to all messaging devices at once
AutoEscalationInterval	Number	Attempt escalation in these many seconds
AutoEscalationRetries	Number	Retry escalation these many times

FIG. 2 Shows various database fields

Userid: 544413988

Password: XXXXXXXXX

AuthCode: 987654321

SendTo: MobilePhone=2149998765, Email=samwals@emsgtech.com, Fax=9729991234,

SendTo: WorkPhone=2148887766, Pager=1234567890@alphapage.Windfelt.com

Server SRV001 is not functioning properly. Please check as soon as possible.

FIG. 3 Sample e-mail/fax by which a message can be sent out.

In this example, a sender sends an e-mail or a fax in a predefined format as shown above. Each line starts with a special tag such as Userid:, Password: AuthCode: , and SendTo:. Then, there is a blank line. After that is the message to be sent. The Userid:, Password: AuthCode: , and SendTo: tags contain the appropriate information that is parsed and processed by the system. The sender, in this example, wants to send the message to a Mobile Phone, an e-mail, a Fax, a Work Phone and a Pager. Therefore, the message sender specifies the required information. The system checks the Userid, Password, and the AuthCode and if correct, sends the message out as requested. It automatically converts the text message to speech to be delivered to telephones and also puts it in an e-mail and a fax. For the pager, the system sends an e-mail to 1234567890@alphapage.Windfelt.com containing the specified message and let's the service provider handle it. Note that though this example shows email/fax, this idea could be extended to other messaging media as detailed in the document.

To: samwals@emsgtech.com
From: Electronic Messaging Engines
Subject: An important alert

When responding back to this message via the Remote Command Execution (RCE), please use the following message record number: 76884533

This message was sent to:

MobilePhone=2149998765, Email=samwals@emsgtech.com, Fax=9729991234,
WorkPhone=2148887766, Pager=1234567890@alphapage.Windfelt.com

Server SRV001 is not functioning properly. Please check as soon as possible

FIG. 4 Sample e-mail/fax received.

NOTE: Each of the engines includes a unique identification number such as, MsgRecNum in database DB-1 (Fig 1 (11)) and Db-2 (Fig 1 (18)). This number is used as part of response back for the system to know which message is a responder responding back to. Similarly, message with same information is received on other messaging devices as detailed in the document.

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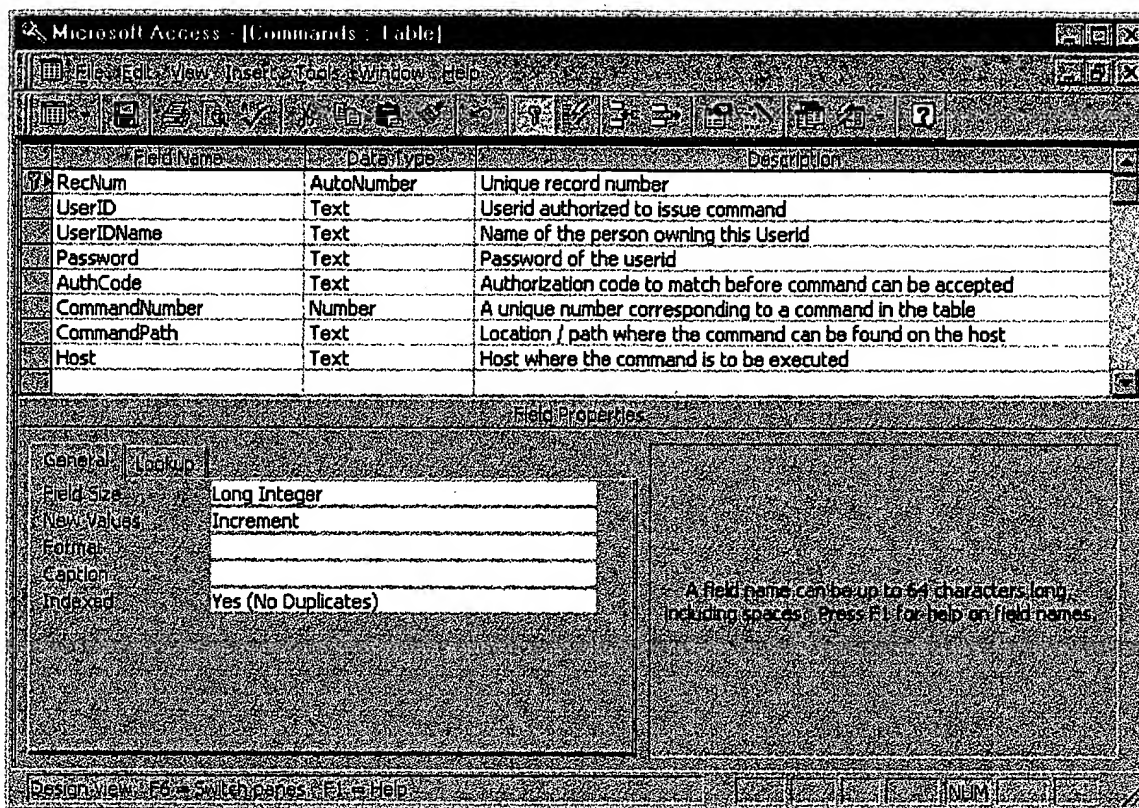


FIG. 5 Commands Table Description

The table shows the various fields in the Commands table that is used by the Remote Command Execution (RCE) facility of this invention.

RackNum	UserID	UserDNam	Password	AuthCode	CommandNumber	CommandPath	Host
1	544413988	SANJIV	XXXXXXXX	987654321	1	C:\RCE\Diag1.exe	SRV001
2	544413988	SANJIV	XXXXXXXX	987654321	2	C:\RCE\Diag2.exe	SRV001
3	544413988	SANJIV	XXXXXXXX	987654321	3	C:\RCE\RPTX.exe	SRV002
4	544413988	SANJIV	XXXXXXXX	987654321	4	C:\RCE\Reboot.exe	SRV002
5	654789922	NEETU	WWWWWW	021234567	1	C:\RCE\Diag1.exe	SRV001
6	654789922	NEETU	WWWWWW	021234567	2	C:\RCE\Diag2.exe	SRV001
7	654789922	NEETU	WWWWWW	021234567	3	C:\RCE\RPTX.exe	SRV002
8	654789922	NEETU	WWWWWW	021234567	4	C:\RCE\Reboot.exe	SRV002
9	256900781	SHIVUM	ABCDEF	223344556	1	C:\RCE\Diag1.exe	SRV001
10	256900781	SHIVUM	ABCDEF	223344556	2	C:\RCE\Diag2.exe	SRV001
11	256900781	SHIVUM	ABCDEF	223344556	3	C:\RCE\RPTX.exe	SRV002
12	256900781	SHIVUM	ABCDEF	223344556	4	C:\RCE\Reboot.exe	SRV002
13	975317680	NEIL	NKAAKN	131284131	1	D:\RCE\ZCmd1.exe	SRV001
17	975317680	NEIL	NKAAKN	131284131	2	D:\RCE\ZDiagCMD2.exe	SRV001
18	975317680	NEIL	NKAAKN	131284131	3	C:\RCE\ZAlert.exe	SRV002
19	975317680	NEIL	NKAAKN	131284131	4	C:\RCE\Reboot.exe	SRV002
(AutoNumber)					0		

FIG. 6 Sample Commands Table Entries

This table is used by the system to allow authorized users to be able to execute command through the Remote Command Execution (RCE) facility of this invention.

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```
[DTE_Server]
DTE-1_Server=216.87.148.210
Port1=1001,1002
DTE-2_Server=216.87.148.211
Port1=1001,1002
DTE-3_Server=216.87.148.212
Port2=1001,1002
.....
.....

[Automatic_Escalation]
Escalation_Device_1=Fax
Escalation_Device_2=Email
Escalation_Device_3=Pager
Escalation_Device_4=MobilePhone
Escalation_Device_5=WorkPhone
Escalation_Device_6=PamPilot
Escalation_Device_7=HomePhone
Escalation_Device_8=Future_Device

[IntelligentDecisionMaking]
AutomaticWakeupTimeComputation=ON
AutomaticTimeZoneComputation=ON

[Database]
Database=C:\ape1d2\DTE_Client.mdb

[ProcessRecs]
Retries=3
DelRecs=1
Interval=60

[License]
Key=EMSG0000-BR01K2PSNEK-12/31/2001-11220ENG

[Logging]
Mode=NORMAL

[Reports]
REMail=SamWals2000@yahoo.com
AutoRep=N
.....
.....
```

FIG. 7 Sample INI file

This file is used by the various engines at initialization time. It serves as start-up parameters.

To: EMME-RB@emsgtech.com
From: samwals@emsgtech.com
Subject: RCE response back

Userid: 544413988
Password: XXXXXXXXX
AuthCode: 987654321
MsgRecNum: 76884533
Command: 2

Issuing command 2. Intend to run Diag2 on SRV001.

FIG. 8

Sample e-mail/fax by which a Command is sent back (RCE).

Sample method of communication back to the system via e-mail. Note that the user could have used other messaging devices, such as, but not limited to a telephone to send such a response back and request execution of a command. The sample, above, specifies the MsgRecNum originally received as part of the message and executes Command 2 (see FIG. 7 for the Command Table). Similarly, responses can be sent back and commands can be executed from other messaging devices by supplying the information shown above:

FIG. 8

Microsoft Access [Directory - Table]

Field Name	Data Type	Description
RecNum	AutoNumber	A unique record number
UserID	Text	Sender's userid (encrypted)
Password	Text	Sender's password (encrypted)
AuthCode	Text	Sender's authorization code (encrypted)
Group	Text	Name of the group to which this person belongs
MailingAddress	Text	Mailing address
email	Text	Regular e-mail
MP	Text	Mobile Phone
HP	Text	Home Phone
WP	Text	Work Phone
PP	Text	Pager Pin
PMN	Text	Pager Modem Number
PE	Text	Pager e-mail
FN	Text	Fax Number
PPEM	Text	Palm Pilot e-mail
FD1	Text	Future Messaging Device 1
FD2	Text	Future Messaging Device 2
FD3	Text	Future Messaging Device 3

Field Properties

Field Size: Long Integer
 New Values: Increment
 Indexed: Yes (No Duplicates)

The field description is optional. It helps you describe the field and is also displayed in the status bar when you select this field on a form. Press F1 for help on descriptions.

Design view | Fields | Switch panes | Properties | Help

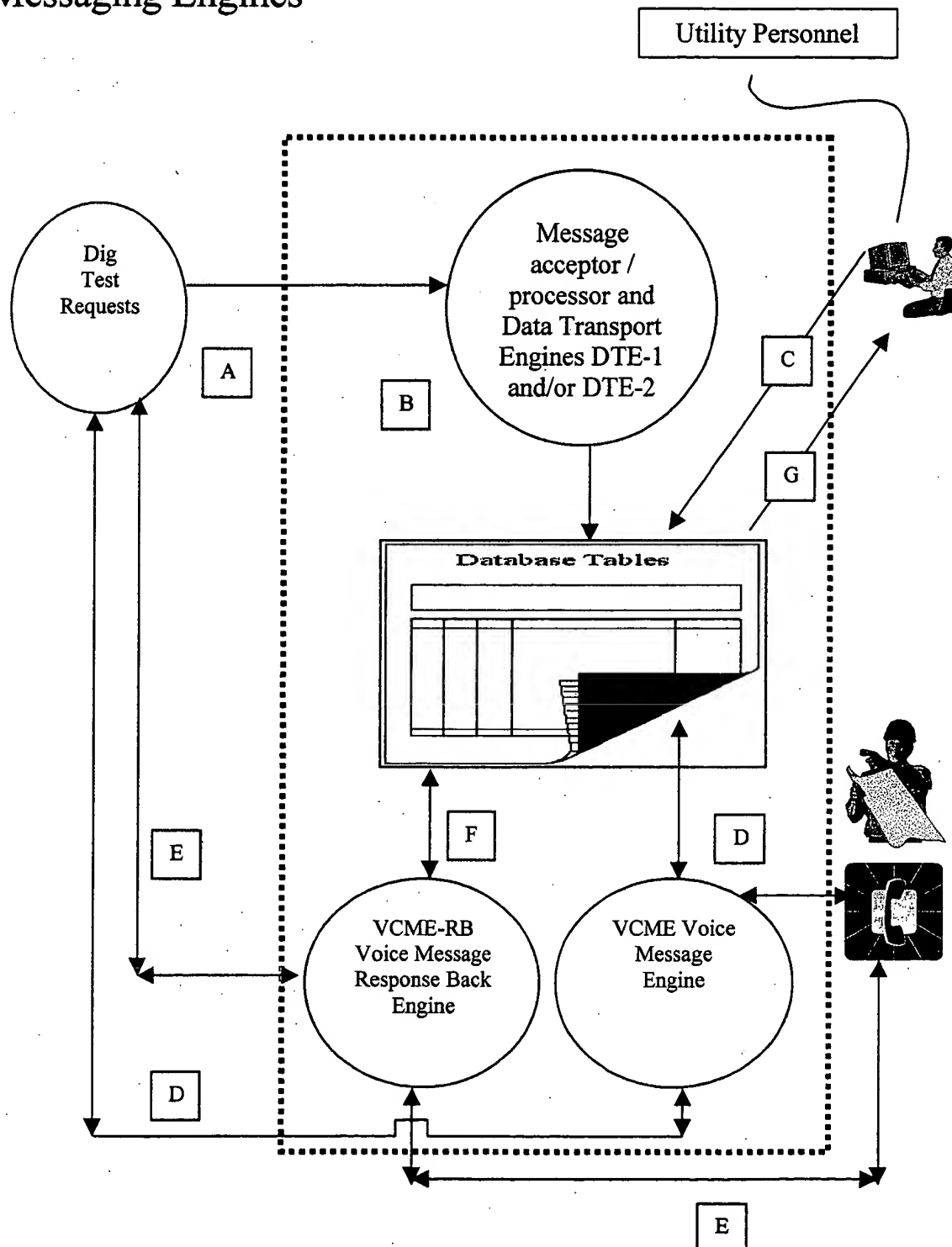
FIG. 9 Sample directory table

This table is used by the system to automatically get details regarding a userid (both – recipient and/or sender) and to resolve groups when sending a Group (broadcast) message.

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FIG. 10

A possible automation of "Dig Test" using Electronic Messaging Engines



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FIG. 11 Explanation of Flow Diagram of FIG 10

Step A.

The requests for "dig tests" are received via various messaging devices and methods, including, but not limited to e-mail, fax, wireless telephones, wired telephones, etc.

Step B.

These messages are accepted and processed by messaging engines such as DTE-1 and/or DTE-2 as described in the document. These engines run continuously and processes new request messages as they arrive. They extracts all required information and updates the database.

Step C.

Utility's authorized personnel authorizes or denies the request based on various laws and regulations. A GUI interface to the database allows the person to mark the record with approval or disapproval.

Step D.

Another automated messaging engine, such as , but not limited to the Voice Message Engine (VCME) , engine which runs continuously scans for such approvals or disapprovals from Step C above. It used advanced telephony technologies to call the appropriate telephone numbers and deliver the approval or disapproval message to the appropriate party. A Utility technician may also be alerted to provide further assistance to the dig requestor.

Step E and F.

The technician out in the field, after receiving a message from the system, calls back to acknowledge receipt of the message. The response back engines, such as, but not limited to the Voice Message Response Back (VCME-RB) engine intercepts the calls from technicians. The system prompts the technician for validation, such as a password, authorization code, and/or a matching request number. If the information is correct, the VCME-RB module updates the database indicating that the technician has acknowledged receipt of the message. Similarly, a message is also sent back to the dig requestor and is prompted to acknowledge receipt of the message using the telephone keypad or voice. The database is updated with the current status (step F).

Step G.

Authorized Utility personnel can further view and report on status of various requests or take other actions via a GUI interfaces to the database.

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